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# Fit-for-purpose institutions? An evaluation of biodiversity conservation in the agricultural landscape of the Tasmanian Midlands, Australia

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**Abstract**

Biodiversity loss is a globally significant problem. Institutional failure to halt this loss suggests current arrangements are not fit for the purpose of conserving biodiversity. The objective of this paper is to diagnose institutional fitness for conserving biodiversity in the Tasmanian Midlands of Australia, a

highly modified agricultural landscape with critically endangered biodiversity values. This paper presents and applies a novel diagnostic framework that adopts a broad view of institutional fit, drawing on concepts from adaptive governance, institutional theory, and public administration, and finds four areas of poor fit that can guide reform efforts. The first is a narrow framing of biodiversity objectives, leading to neglect of key social and ecological concerns. Second, the interplay of current arrangements fails to buffer key economic and political drivers, and compromises adaptive capacity. Third, limited government authority and embedded power relations raise questions about the effectiveness and fairness of current approaches. Finally, the reluctance of governments to devolve authority and decision-making powers to self-organizing networks constrains adaptation. This suite of fit problems constrains achievement of biodiversity conservation, particularly in dealing with landscape multifunctionality, the need to balance private landholder rights and responsibilities, and the need to consider how to respond to emerging novel and hybrid ecosystems.

**1.0 Introduction**

Many individuals and organizations have been working for decades to conserve biodiversity and address the causes of its decline. Despite global targets to halt biodiversity loss, even modest commitments have not been met; and rates of loss show no signs of slowing (Butchart et al., 2010). Institutions, and the governance systems of which they are a part, are critical to addressing biodiversity decline because they mediate between human and environmental systems and can influence the trajectory of these systems (Chaffin, Gosnell, & Cosens, 2014). Institutions are the regulative, normative, and cultural-cognitive elements that structure, stabilize, and provide meaning to social life, and shape the structure and identities of organizations and individuals (Scott, 2014). Though critical to success, the failure of current institutional arrangements suggests significant change is imperative if future targets are to be met (Hill, Halamish, Gordon, & Clark, 2013).

Effective biodiversity institutions must be fit-for-purpose. The concept of institutional fit has achieved currency in the environmental governance literature, with many authors discussing the need for institutional arrangements to match the spatial, temporal, and functional aspects of the ecosystems governed (e.g. Folke, Pritchard, Berkes, Colding, & Swedin, 2007). Biodiversity conservation requires attention to multiple spatial scales, and policies focusing on landscape-scale approaches are needed to accommodate the complexity of ecosystems and ecosystem processes (Gonthier et al., 2014). Institutional approaches to conserving biodiversity are diverse, but can be grouped into three broad categories: 1) protecting assets, 2) responding to threats, or 3) supporting the conditions of ecosystem processes (Curtis and Lefroy, 2010). Driven by legislative frameworks, many conservation initiatives tend to focus on the conservation of individual assets (e.g. endangered species) and threats to these assets (e.g. invasive species). This means that in practice many countries, such as Australia, tend to focus time and investment on the first two categories. While efficient, this can be a source of institutional misfit, as it tends to neglect the broader social-ecological context and underlying causes of biodiversity decline (Clement et al, 2016; Curtis and Lefroy, 2010).

Institutions also need to fit the functional and temporal dimensions of ecosystems, requiring adoption of long-term strategies, responses to short-term changes causing irreparable damage, and buffering against a diverse range of drivers of change (Steinberg, 2009). Political and cognitive dimensions also need to be considered, including how biodiversity institutions fit within dominant perspectives on nature conservation and the broader governance context (Vatn and Vedeld, 2012).

The concept of fit-for-purpose institutions highlights a need for governance systems that are equipped to cope with the dynamics of change and adaptation. The non-linear dynamics of linked human-environment systems – with the added pressures of climate change – require biodiversity institutions able to cope with complexity and uncertainty as futures are created (Folke, 2006; Stein et al., 2013). Adaptive governance offers a model for institutional design with improved fit, as it provides a

framework for decision-making that deliberately fosters capacity to cope with uncertainty and complexity (Chaffin et al., 2014). It calls for collaboration across multi-layered governance networks, multiple centers of authority, and deliberative decision-making (Lebel et al., 2006). Such features can complement existing governance arrangements to inform and enable effective and realistically achievable governance transitions, provided contextual conditions are taken into account (Rijke et al., 2012).

The objective of the research reported in this paper was to diagnose the fitness for purpose of biodiversity institutions in a highly modified agricultural landscape. Conserving biodiversity is a challenging task irrespective of location but it is even more challenging and complex given the multiple demands on agricultural landscapes. There is an expanding global interest in enhancing agricultural productivity and maintaining rural livelihoods whilst ensuring biodiversity and ecosystem services are conserved (Dobrovolski, Loyola, da Fonseca, Diniz-Filho, & Araújo, 2014; Sayer et al., 2013). Our case study, the Tasmanian Midlands of Australia, exemplifies these challenges and provides an ideal testing ground for exploring institutional fit.

This research applies an original framework for diagnosing institutions outlined in Section 2.1 to the landscape described in Section 2.2. The results in relation to framing, interplay, power and authority, and self-organizing (Section 3) are followed by a discussion of what these results mean for institutional fit and for resolving conflict in the Midlands (Section 4). A key contribution of this research is that it expands the notion of fit as used in the adaptive governance literature by focusing on the range of factors that are important in the complex institutional context (Lubell, 2015). It does this in two ways: first by adopting a broader concept of misfits, that includes cognitive and political fit (Clement et al., 2016), and second by using a framework that attends to gaps in the adaptive governance literature, as discussed in the next section.

## 2.0 Conceptual framework, study area, and diagnosis

### 2.1 Conceptual framework

The novel conceptual framework underpinning this study (Clement et al., 2016) (Fig. 1) derives from Young's (2002, 2008) efforts to diagnose international institutions. It is specific to the diagnosis of biodiversity institutions, and incorporates concepts from adaptive governance, institutional theory, and public administration. Four areas of focus are included in the framework: problems and players, politics, competence, and capacity.

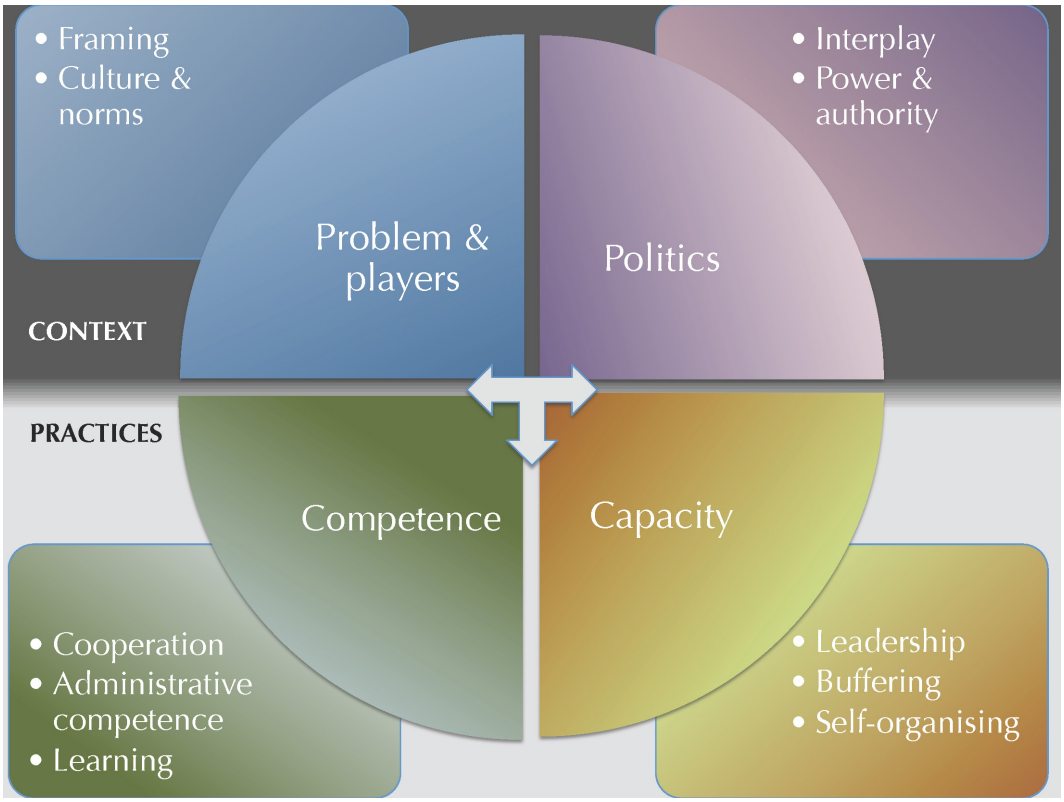


**Figure 1. Diagram of conceptual framework used in this diagnosis (Clement et al., 2016)**

Although grounded in Young's (2002, 2008) diagnostic, the framework departs from his focus on international agreements to address the conditions supporting biodiversity conservation at multiple scales. The framework addresses conflicting demands for organizations to be more 'adaptive' while

recognizing the administrative limits of key actors in biodiversity governance, who often have low levels of discretion and high levels of responsibility (Rijke et al., 2012; Wyborn & Dovers, 2014). The framework leverages the potential of adaptive governance to improve institutional fit, but acknowledges the practical limits of actors operating in institutional environments.

Insights from institutional theory relating to organizations and public administration are important enhancements on adaptive governance concepts used, including interplay (e.g. Oberthür & Gehring, 2011) and organizational buffering (e.g. O'Toole & Meier, 2011). Rather than focusing on biophysical conditions alone, the institutional literature attends to a diverse suite of causes of interactions and highlights how external pressures in institutional environments limit effectiveness. Integrating these concepts into the framework addresses the need to consider how adaptive governance might, in an ideal world, achieve better fit by grounding the diagnosis in the practical realities of institutional environments and the competing logics actors in this environment face when conserving biodiversity (Wyborn & Dovers, 2014). This can enhance understanding of fit and point to more effective strategies for managing institutional as well as ecological interactions and pressures. The framework's dual focus on adaptive governance and more 'traditional' institutional literature leverages the potential of adaptive governance to improve capacity and institutional fitness for conserving biodiversity, while addressing a shortcoming of this literature by acknowledging the practical constraints of actors operating in institutionalized environments

This provides a more comprehensive diagnosis of fit than other approaches to-date because it ensures that that fundamental conditions, such as formal authority, skills, knowledge and resources (i.e. general capacity), are considered in addition to the more reflective, dynamic practices emphasized in adaptive governance (i.e. institutional adaptive capacity). For example, the framework directs attention to self-organizing (Figure 1). The adaptive governance literature stresses the role of self-organizing networks in fostering resilience by preparing the governance system for unknown unknowns (Boyd and

Folke 2011). The institutional literature also highlights the role of such networks in providing stability, legitimacy, and resources (Powell and DiMaggio 1991); but draws more attention to the importance of the institutional context in either constraining or supporting self-organizing capacity, while also providing guidance on how to foster self-organizing within institutional constraints (Ansell 2011).

**2.2 Tasmanian Midlands and the institutional context**

The Midlands is a rural agricultural valley in the island State of Tasmania south of mainland Australia (Figure 2). Its small population of 4,709 is distributed across a few small towns and relatively large agricultural holdings, with an average holding of 1,750 hectares, about four times the State average (Gadsby, Lockwood, Moore, & Curtis, 2013). Landholders play a critical role in biodiversity governance in the Midlands. With 98 percent of the landscape in private ownership, it is Tasmania's most under-reserved bioregion (Cowell, 2008).

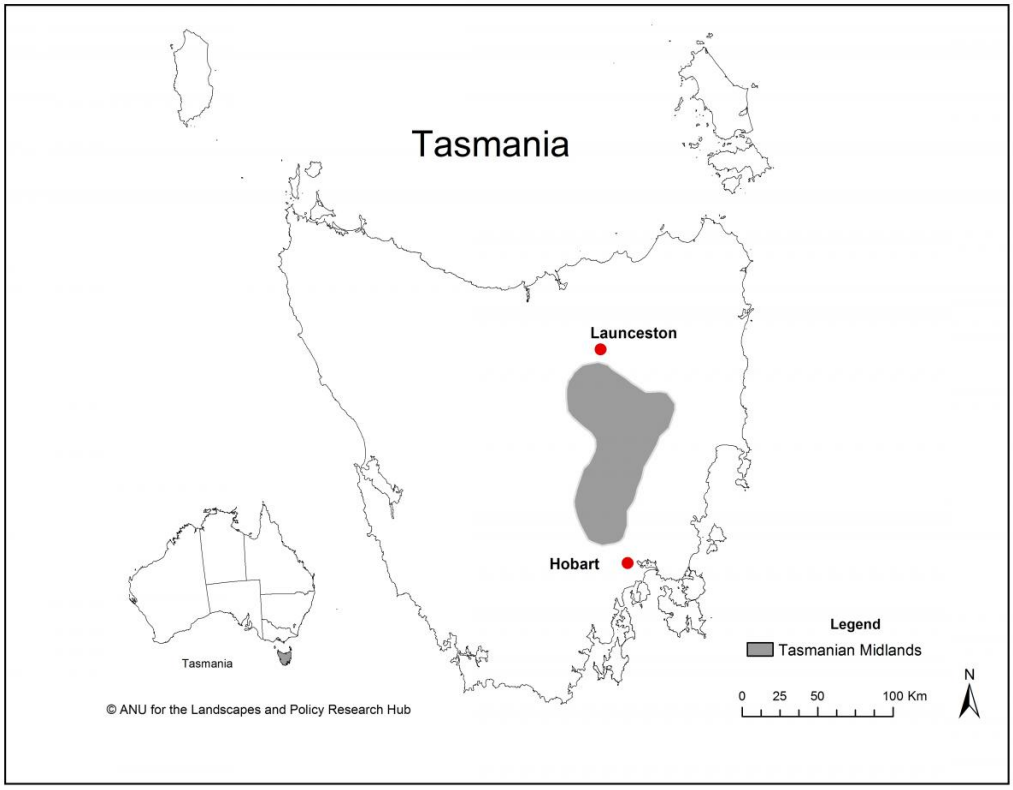

**Figure 2. Location of Tasmanian Midlands region**

As Australia's oldest continually grazed landscape, the Midlands were emblematic of the popular notion that the country was 'riding on the sheep's back' until a steep decline in wool prices in the 1980s. The shift away from a reliance on native pastures to non-native improved pastures, and more recently to intensive irrigated crops, has contributed to declines in the extent and condition of native grasslands (Kirkpatrick & Bridle, 2007). The trend toward intensification is expected to continue, spurred by significant investment in a 71,105-hectare irrigation scheme, the Midlands Water Scheme (MWS).

In a landscape of degraded, fragmented biodiversity assets, any increase in land under irrigation could exacerbate decline. Although other flora and fauna are listed and have been targeted by conservation programs, at the moment native grasslands are a political and financial priority for conservation, especially the critically endangered Lowland Native Grassland Ecological Community listed under the federal *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) (Australian Government, 2010). While historically important for producing the fine wool for which Tasmania is known, the grasslands have been under increasing threat. This threat is projected to increase, with over 40 percent of these listed grasslands are within the MWS boundaries and at risk without appropriate mitigation (DPIPWE, 2010). The Tasmanian Government has committed to no further clearance and conversion of EPBC listed grasslands through its regulation of the Scheme (DPIPWE, 2011), but this commitment does not apply to other important but unlisted native grasslands.

The three tiers of government (federal, State, local) and non-governmental organizations (NGOs) all play a role in biodiversity governance. The federal government's role is primarily through the EPBC Act but it also provides funding for State and regional initiatives. At the State level, the Department of Primary Industries, Parks, Water and Environment (DPIPWE) is responsible for implementing biodiversity policy. It offers programs encouraging conservation on private land, favoring

conventional approaches including fixed term and perpetual covenants, and management agreements (Mendel & Kirkpatrick, 2002). One key initiative, the Protected Areas on Private Land program, has been offering incentives for the adoption of voluntary conservation covenants for 15 years (DPIPWE, 2013). Primarily these instruments limit the extent and timing of disturbance, such as grazing and prescribed burning, with limited provision of financial support, conservation advice and monitoring due to financial constraints. NGOs have played more prominent roles in recent years, becoming responsible for facilitating delivery of agri-environmental programs, and providing advice and financial assistance to landholders.

Initiatives in the Midlands follow a global neoliberal shift towards blended state-supported and community-based governance approaches (Higgins, Dibden, Potter, Moon, & Cocklin, 2014). For example, State and federal governments have run market-oriented tender processes targeting under-reserved vegetation communities listed under the EPBC Act that achieved a high level of uptake due to substantial compensation packages but are thought to have delivered limited biodiversity outcomes (Iftekhar, Tisdell, & Gilfedder, 2014). The Midlandscapes initiative combines payment for ecosystem services with targeted investment in focal biodiversity features (e.g., lowland grasslands, grassy woodlands, lowland alluvial systems, wedge-tailed eagles and vulnerable marsupials) to achieve landscape-scale results. Operated by NGOs, and funded mainly through philanthropic support, the initiative includes the Midlands Conservation Fund (MCF), a perpetual fund providing payments to farmers who enter into 5 to 10-year stewardship agreements. The program is informed by a Conservation Action Plan (CAP), jointly developed by NGOs with the support of DPIPWE, and its success has received national recognition (Australian Government, 2012).

**2.3 Institutional diagnosis**

To diagnose institutional fit in the Tasmanian Midlands, the conceptual framework was used to design a set of interview questions asked of 49 respondents through semi-structured, in-depth interviews. The interviewees were purposively selected for their involvement in landscape-scale biodiversity conservation policy formulation and implementation in the case study region (Table 1). Most government interviewees were from middle management, given their critical link communicating between planning and operations (Ansell, 2011). Landholders were also interviewed as their behavior is critical to conserving biodiversity in this landscape. An initial list of interviewees was identified through a key informant with specialist knowledge of biodiversity governance in the Tasmanian Midlands. Additional interviewees were identified through snowball sampling (Atkinson & Flint, 2003).

**Table 1. Individuals interviewed in each category**

| Category | Number of interviewees |
|---|---|
| Australian Government (Department of Environment, Parks Australia, and Department of Agriculture, Fisheries, and Food) | 11 |
| Tasmanian Government (Department of Primary Industries, Parks, Water and Environment (DPIPWE)) | 9 |
| NGOs[1] (non-government organizations) involved in environmental and NRM (natural resource management) work (Bush Heritage, Tasmanian Land Conservancy, Greening Australia, NRM North, NRM South, and Landcare Tasmania) | 10 |
| Landholders[2] and their representatives in the Tasmanian Farmers and Graziers Association | 7 |
| Researchers | 5 |
| Local government (Northern Midlands and Southern Midlands Councils) | 3 |
| Irrigation interests (Tasmanian Irrigation, a consultant, and Hydro Tasmania) | 4 |
| TOTAL | 49 |

[1] While NRM North and NRM South are quasi-governmental (they have a statutory basis but are not government agencies), all interviewees in this group have been referred to as 'NGO interviewees'.
[2] In addition to these landholders, four NGO interviewees also owned agricultural operations in the Tasmanian Midlands.

Interview transcripts were analyzed to identify comments relating to each framework component. These were then further scrutinized to identify strengths of current arrangements, and arrangements constraining achieving biodiversity objectives, particularly those pointing to institutional misfits. From this analysis, four of the ten framework components were identified as being particularly relevant to biodiversity conservation in this highly modified landscape, as they underpinned the problems of fit described by respondents. These components (framing, interplay, power and politics, and self-organizing) provide the focus for the diagnosis presented in this paper (see Table 2).

**Table 2. Summary of framework components most salient to this case study**

| Component and definition | Key considerations for institutional fit |
|---|---|
| **Framing:** Frames order actors' evaluations and perceptions by selecting aspects of a perceived reality and making them salient (Entman, 1993). This component considers how biodiversity conservation is defined and understood, causes of decline, the players involved, and the institutional solutions to address it. | • Framing links to key problem characteristics, sets the agenda, determines who is involved, and drives action.<br>• It reveals significant attributes of the biodiversity policy problem in context that are critical to identifying misfits.<br>• Problems with framing can cause dysfunction in many areas of a governance regime. |
| **Interplay:** Interplay refers to cross-level and cross-scale institutional interactions (Young, 2002). This diagnosis examines interplay from the perspective of political and functional dynamics and the interactions between different institutional regimes (Paavola, Gouldson, & Kluvánková-Oravská, 2009), thus dividing interplay into three dimensions: functional, political and regime. | • Interplay links biodiversity institutions to other types of institutions and to the political and ecological arena, revealing the important adaptive governance characteristic of buffering.<br>• Analysis of interplay can help address conceptual ambiguities on fit (Vatn & Vedeld, 2012). For example, one dimension of interplay (regime) addresses the lack of emphasis on the strength of natural resource institutions relative to other regimes (e.g. economics, property rights). |
| **Power and authority:** Power is exercised when actors pursue values, interests and goals (Gordon, 2009). Authority bestows formal roles and responsibilities on individuals and organizations (Hutchcroft, 2001). Adaptive governance supports greater power sharing and the devolution of power and authority to appropriate levels. | • Institutions codify power relations, empowering certain actors and disempowering others, which can create inequalities (Moe, 2005). Analyzing this dual role of institutions can reveal how embedded power relations affect institutional fit.<br>• Both adaptive governance and landscape-scale conservation require collaboration. Power and authority shape the structure and process of collaboration by deciding who is involved, how issues are framed, where resources are directed, etc. (Purdy, 2012). |
| **Self-organizing:** This component addresses: whether actors are empowered to act at | • Self-organizing networks can build capacity for dealing with unknowns, store institutional memory, |

| Component and definition | Key considerations for institutional fit |
|---|---|
| appropriate scales (e.g. subsidiarity); the presence of active networks providing informal spaces for sharing and making decisions based on knowledge, experience, and chance (shadow networks); and institutional support for networks. | fill gaps in formal responsibilities, and provide backup capacity (Boyd & Folke, 2011).<br>• Institutional conditions can prevent or inhibit self-organizing by networks. |

As underlined in the results and revisited in the discussion, these four areas demonstrate the value of thinking about fit in a broader sense than is typical in the adaptive governance literature. For example, the tension between the need to enable autonomy and self-organized networks, whilst also providing a stable institutional environment and resources, is exemplified in the Tasmanian Midlands, an agricultural landscape where landholders self-organize with each other and government to participate in conservation with the support of government and non-government organizations.

**3.0 Diagnosis of current arrangements**

The diagnosis, based on an analysis of interview transcripts, revealed concerns coalescing around four diagnostic components (Table 1): (1) narrowness with which current biodiversity conservation initiatives and policies have been framed; (2) interplay, involving a dominance of economic and agricultural institutions resulting in perceived weakening of biodiversity institutions; (3) power to effect change held by a few landholders and limited scope of formal authority; and (4) challenges in realizing the potential of new solutions through emergent self-organizing networks.

**3.1 Framing**

Analysis of the ways in which interviewees framed their notions of landscape-scale biodiversity conservation revealed a misfit between institutional instruments and the problem to be addressed. Despite interest from State and federal government in landscape-scale approaches, interviewees were concerned that most programs focused on conserving individual listed species or patches of vegetation. A landscape-scale approach that explicitly considered ecosystem function and large-scale threatening

processes was viewed as a more fitting approach for a fragmented bioregion like the Midlands. The contrast between the nature of the problem and the narrow framing by legislation was a concern for most interviewees. As a highly modified landscape where landholders own nearly all biodiversity assets, many thought conservation was necessarily broader than the legislatively framed notion that emphasizes protection of rare species and ecological communities.

The Midlands was frequently described as a 'working landscape', where a critical consideration was how to make biodiversity conservation a viable activity on productive farms:

> *It is a working landscape with some natural values. So it's about how to manage the biodiversity within that context and not about changing the context.* (Tasmanian Government interviewee)

Many interviewees stressed that biodiversity could not be considered independently of its socio-economic context given the long agricultural history of the landscape and its almost entirely private tenure. Perceiving Midlands as a working agricultural landscape required a shift away from a protectionist view of conservation towards a more flexible landscape-scale approach. Active management and disturbance were seen as critical, and actively managing native grassland ecosystems for biodiversity outcomes was viewed as important regardless of any legislatively protected status. Many interviewees also expressed concerns that the institutional view of biodiversity conservation as a problem primarily of species composition and structure was too narrow, particularly as climate change would likely change both aspects. In an already modified landscape, maintaining ecosystem functions and addressing the degraded condition of the Midlands emerged as a more appropriate target:

> *The question for me has changed a little bit away from the traditional conserve, protect, language to functional thresholds…just what makes a healthy functional landscape that other things can operate in, like agriculture?* (NGO interviewee)

While the suite of policy instruments used over time has diversified, most thought this could be improved further by developing solutions building on the region's multifunctional, 'working landscape' context. For example, although the State had successfully secured many restrictive covenants and prescriptive management agreements, the general view was that these more rigid legal agreements

were of limited use in securing the future of the grasslands. These prescriptive instruments not only constrain property rights, but their philosophy is antithetical to the landholder view of native grasslands as requiring active, flexible management, borne from decades of experience. Most interviewees recognized the need for better solutions, and heralded the MCF as a welcome new outcomes-oriented approach. Amidst the optimism there was some minor skepticism, however, including whether the financial incentives available through the MCF would be sufficient to engage landholders, and whether the outcome-based agreements would be effective in the absence of prescriptions.

Although interviewees acknowledged that landholder behavior could exacerbate biodiversity decline, they emphasized the positive role landholders could play and the ways in which institutions could motivate them to participate. In a privately owned landscape, most interviewees accepted that financial viability was a pre-condition for participation, with several repeating the adage 'you can't be green if you're in the red'. As one landholder commented:

> *We recognize the need for these farms to be businesses first and foremost. We also have a strong commitment to handing the farm on to the next generation if they so desire, and we'd also like to have it productive and in a better environmental state. Much of that has dictated our decision-making along the way and we are thinking constantly of the next generation in how we approach conservation.*

Many interviewees discussed the need for institutional interventions that made conservation a more attractive prospect in this working landscape. However, many also lamented the shift away from traditional industries like wool, seen as more complementary with biodiversity conservation than irrigated crops, and expressed nervousness about how economic and land use pressures would be managed under current legislation and in the broader political climate.

**3.2 Interplay**

Two types of interplay dynamics dominated: 1) regime interplay, where interactions between biodiversity conservation institutions and related economic and agricultural institutions affected the efficacy of the former, and 2) political interplay, where political agendas and investment in irrigation

exerted strong pressure on organizations managing biodiversity. A continuation of the trend toward agricultural intensification, exacerbated by development of the MWS and strong pro-development policy drivers, was perceived to be one of the most significant threats to the future of the grasslands. Most interviewees considered economic development the dominant driver setting Tasmania's political agenda, with rhetoric around a Tasmanian 'food bowl' being emblematic of this. Although some commented that high water prices and poor land capability would protect the Midlands from ecological disaster, there was skepticism that biodiversity institutions had sufficient strength or enabled sufficient foresight to buffer negative and cumulative impacts across the landscape.

When discussing the technical challenges of developing a long-term program to conserve biodiversity in the strategic assessment of the MWS, some noted such concerns were secondary to political imperatives. With agriculture being poised as the 'economic savior' of Tasmania, one Tasmanian Government manager discussed the challenge of developing strong policy for biodiversity conservation in the face of an agricultural imperative:

> *The bits around the edges about flexibility, trying to ensure longevity in terms of how these farm plans would look, what they had to consider, were just that. They were the bits around the edge... The focus of the process was it being a means to an end.*

Interviewees were concerned that biodiversity institutions were not designed to cope with the pressures of politics. Policies were written with enough 'wiggle room' to allow economic and political institutions to take priority and were not backed by sufficient authority. Many considered there was insufficient political will for serious action on biodiversity conservation, even though the decline is likely to worsen under a changing climate. Global commodity markets were seen as even more daunting, being beyond local control but a highly significant factor on landholder decision-making and the future of biodiversity. Although the language of sustainability runs throughout policies and programs, how the dual objectives of development and conservation would be achieved in practice is not explicitly addressed:

> *We have some really great biodiversity assets, and we're not going to be able to possibly keep them all… there's got to be some decisions made, and this is the thing...they're not made explicitly. They are made in the context of, you put one institutional lens across one area as conservation, and one institutional lens across the other is development. And never the twain shall meet, you know?* (NGO interviewee)

A perceived lack of alignment between State and federal approaches was a common political interplay dynamic noted by government interviewees. The decision not to list the grasslands at State level was used to illustrate this lack of alignment, and was linked to reflections about which approach worked best: the 'carrot' (e.g. financial incentives) or the 'stick' (e.g. regulation). Others considered trust and goodwill to be most important:

> *I personally don't think regulation will protect the grasslands…It's actually about appropriate management that implements biodiversity conservation into those systems. With trust and goodwill, working with the landholders.* (Tasmanian Government interviewee)

Indeed, a cooperative, norms-based approach was widely seen as effective in dealing directly and explicitly with the interface between agriculture, biodiversity, and the economy in this landscape.

**3.3 Power and authority**

In the Midlands, the power to manage (or not) for priority biodiversity attributes is concentrated in the hands of a few landholders. Though most participants felt all grasslands were important, institutions drive investment in only a subset of those grasslands, with one manager estimating that 10-12 landholders own about 70% of these grasslands. While these landholders were seen as being highly engaged and conservation-minded, they also hold considerable power given the bulk of this asset exists on their properties. Even though governments hold regulatory authority, many interviewees considered that in practice private property rights mean decision-making power over what happens to the grasslands rests with these landholders. One Tasmanian Government interviewee noted that more prescription and constraints were unlikely to be successful with these landholders, and approaches based on trust would bring more success. This is especially so given the time it takes to build trust, and evidence of high levels of trust already in place:

> *We've been lucky because people like* [Tasmanian Government employee] *have bothered to try and get inside the heads of farmers. They have sat with us, they've talked to us, they've done our courses; they've seen what it's like to follow droughts to their end conclusion. They have seen seasons come and go; they've seen succession within families. They've seen how time passes in our landscape and I think that has enabled them to have a greater understanding of what we have to juggle.* (landholder interviewee)

The impact of trust through these relationships, and those involving the collaborative establishment of the MCF, was evident across interviews with landholder, government, and NGO participants.

While relationships with these key landholders were valued, a tension between fairness and efficiency arises. Engaging the same landholders time and again makes sense from an efficiency perspective but challenges an ethic of fairness:

> *If you want to achieve landscape-scale conservation, you really need to spend it, I believe, in a few localized spots. And a lot of money to a few people. And socially that's not something we like to do.* (Tasmanian Government interviewee)

Some interviewees noted that such an approach misses opportunities to engage a broader suite of landholders who could contribute to landscape-scale outcomes, especially to connectivity and future adaptation as climate envelopes shift. Though interviewees generally considered the public good value of conservation should be rewarded, there was some discomfort that resources are mostly directed to a small subset of landholders. Concerns were raised about the level at which landholders should be paid, and whether it is payment for going beyond duty of care or for providing a public good. There was also a lingering discomfort with offering incentives *and* providing increased autonomy to landholders, particularly among government interviewees and most acutely at the federal level.

Doubts about whether there was sufficient government authority to respond to the major drivers of biodiversity decline were pervasive. One Tasmanian Government interviewee noted that legislation "naively" works for those already inclined to "do the right thing". Also, in a region where legislatively protected vegetation is only a small part of the landscape, authority to intervene only in those patches meant there were large holes in the regulatory safety net. Under MWS, for example, mitigation measures apply only to federally listed grasslands, and some interviewees could envisage a

future where only these pockets remain and ecologically important but unlisted vegetation are lost. Even more concerning for some was the lack of authority to deal with routine but potentially high impact land use decisions:

> *If you've got sheep farming, or dry land poppies, and you decide to go into intensive irrigated orchards, you don't have to apply to anyone for a change of land use… you've got this weird situation where you've got Commonwealth legislation driving a lot of the planning approaches. And the reality is: it's probably irrelevant.* (Tasmanian Government interviewee)

In addition, although clearing listed grasslands is illegal, benign neglect and mismanagement are not, and fertilizing or overgrazing could convert a patch of grassland to one that no longer meets legislated criteria.

**3.4 Self-organizing**

With a small population and a large number of conservation initiatives, networks have developed where information and experiences are shared and new approaches explored. These include the Tasmanian Rangelands Group, a small group of landholders owning properties with significant biodiversity values, and the Midlands Coordination Group of organizations working on conservation in the region. Scarce resources and a competitive funding environment have limited the ability of these networks to implement and 'scale up' new institutional arrangements for conserving biodiversity, as has government hesitation to provide greater autonomy and power to these groups.

The Tasmanian Rangelands Group collaborate in the pursuit of agreements to financially support biodiversity conservation as part of their enterprises, and have developed a sophisticated business case for pursuing philanthropic donations. Learning from approaches abroad, particularly the Malpai Borderlands Group and Carrus Land Systems in the US, and supported by NGOs and individuals in government, they promote conservation on their farms as another managed element of a 'working landscape'. However, their temporary agreement with the State government lapsed due to insufficient political support, and institutionalization of their efforts has failed. As one landholder explained:

> *We have yet to see the rewards that truly reflect the cost to us… We can see the ownership, or influence that we've had on those programs… no longer do those conservation groups feel they have to own the land within our landscape.*

The Midlands Coordination Group was formed to better coordinate the various conservation initiatives, and comprises government and non-government agency representatives. It has faced typical challenges of formation, including lack of resources or incentives from their organizations for spending time on such non-core activities. Competition was another factor, with members often vying for the same (primarily government) funding and struggling to define their role and niche:

> *It's still this stepping over each other when it comes to the roles of who does what and sticking to that. Until those are defined and agreed and then held to, your collaboration's just at best inefficient, if not it becomes unhelpful.* (NGO interviewee)

The competitive environment has meant that some groups have been more successful than others in tailoring their programs to government priorities and hence the receipt of government funding.

A tension between building programs at the regional level and aligning these smaller scale agendas with national priorities was evident. NRM groups experienced difficulties accessing national when local needs diverge from national priorities, despite being responsible for regional delivery of agri-environmental programs:

> *[The government] provided the same level of funding to regions… but they could only use that money to address national priorities, which caused a lot of difficulties in some regions where there weren't many or any identified national priorities.* (Australian Government interviewee)

One interviewee suggested the federal government's hesitant decentralization is a recurring problem:

> *It's this thing about the willingness of governments to send certain functions, roles, responsibilities at arm's length… so they expand massively and then they contract and draw into the center. Then they get brave and expand again. And it makes this whole phenomenon of cooperative environmental federalism look quite vulnerable.* (researcher interviewee)

This centralized agenda setting by the federal government is adversely affecting efforts to self-organize in places such as the Midlands. The actions of regional and local groups are heavily reliant on an income stream from government that is divorced from their local context. As self-organizing is not linked with national priorities, funding to support such initiatives is largely inaccessible.

## 4.0 Discussion

### 4.1 Institutional misfits

The diagnosis highlights four areas where institutions are not fit for the purpose of conserving biodiversity in this highly modified agricultural landscape. First, institutional framing is out of step with social and ecological understandings of the conservation problem in the Midlands. Second, biodiversity institutions are failing to buffer key economic and political drivers of decline. Third, limited government authority and embedded power relations raise questions about the effectiveness and fairness of current approaches. Finally, despite having adaptive capacity available in self-organizing networks, reluctance to devolve authority and decision-making powers to these networks is constraining institutional change. These findings demonstrate the value of considering fit more broadly, and are of relevance to the future of the Midlands and the future of biodiversity conservation in other highly modified agricultural landscapes more generally.

The 'narrow' framing in the Midlands of biodiversity conservation as protection of rare assets (i.e. specific grassland communities) largely neglects ecosystem processes, even though such processes are pivotal to integrating landscape-scale efforts into biodiversity policy (Bennett et al., 2009). Despite some movement in practice, there remains a need to provide formal legislative authority for landscape-scale conservation (Clement et al., 2015). This is especially the case for highly modified landscapes, where, according to interviewees, the false dichotomies between production and conservation, and between social and ecological, must be bridged or even expunged. Conserving and reestablishing ecosystem function in a 'working landscape' was seen as a more fitting philosophy for the Midlands. Inspiration from the US example of the Malpai borderlands was evident, especially the way in which institutional re-framing enabled landholders in the borderlands to make conservation a financially viable proposition on their properties alongside agricultural production (Sayre, 2005). The prospect of agricultural intensification reinforced views that the future of biodiversity in the Midlands demanded a

more sophisticated approach to dealing with socio-economic dimensions of the system, which is reasonable given experiences in other landscapes (Polasky, Nelson, Pennington, & Johnson, 2011).

Issues with interplay were clearly exposed. Conflicts between the institutions governing economic development, agricultural production, and biodiversity conservation are sources of misfit, with overlapping institutional frameworks often working at cross-purposes (Brown, 2003; Paavola et al., 2009). Such interplay is known to stymie achievement of biodiversity objectives, especially in agricultural landscapes (Henle et al., 2008), and the Midlands experience mirrors the global challenge of harmonizing conservation with food production through agricultural intensification (Dobrovolski et al., 2014). Conflicting commitments can also have mutually disruptive effects that decrease the effectiveness of institutions targeting both (Oberthür & Gehring, 2011). Because conservation and agricultural development overlap in their geographic focus but have divergent objectives, actors in the Midlands are pulled in different directions. This provides room for individual landholders and organizational actors to pick and choose between the obligations of each institution and disregard those that are inconvenient (Gehring, 2011), including limiting extent of economic development due to environmental commitments. As such, this case study can be viewed as a microcosm of similar interplay dynamics at the international scale, such as those involving the World Trade Organization and multilateral environmental agreements, where overlap between these institutions has had a chilling effect on the development of effective environmental agreements (Eckersley, 2004), or where environmental commitments have restricted free trade (Gehring, 2011).

These problematic interplay dynamics are closely related to and influenced by authority and power. At the most basic level, formal authority for conserving biodiversity was perceived as weak, not just in relation to other institutions, but also due to the narrow scope of legislation and its failure to deal with land use decisions exacerbating biodiversity decline (Clement et al., 2015). In contrast, a small group of landholders holding most of the prioritized biodiversity values were considered powerful.

These embedded asymmetrical power relations are in part historical artifacts, as wealthy colonial settlers in the Midlands received free land grants in the 1800s (Boyce, 2008). However, the narrow framing of current biodiversity institutions exacerbate the perceived asymmetry, given comparative benefits directed to this smaller subset of landholders, and disempowering others who miss out. While engagement of landholders with priority assets is positive for biodiversity, perceptions of asymmetry in power relations can hinder development of long-term solutions to interplay problems, and lead to further separation between conservation and economic institutions (Gehring & Faude, 2014). The situation also raises questions about fairness and the capacity to achieve landscape-scale outcomes. Fairness demands smallholders be given opportunities to participate and access resources (Lockwood, Davidson, Curtis, Stratford, & Griffith, 2010). Landholders privileged with resources and experience could act as network leaders and their trusting relationships with key government actors could facilitate cooperation and learning across the landscape (Graham, 2014). Over the long term, a more diverse array of stakeholders could become engaged, thus broadening the institutional framing and building adaptive capacity (Chaffin et al., 2014).

This suite of issues related to narrow framing, problematic interplay, and asymmetrical power relations also demonstrates the value of using a broader conception of the problem of fit. The idea of buffering against ecological drivers is central to the notion of adaptive governance (Boyd and Folke 2011), whilst the idea of managing interplay is central in the institutional literature. Bringing the two schools of thought together highlights the need to buffer problematic institutional drivers as well as ecological ones to achieve better fit. The diagnostic also showed how *both* ecological and institutional rationality can be at odds with calls for adaptive governance. While inclusivity and collaboration across scales are central concepts in the adaptive governance literature, in the Midlands there are both ecological and institutional reasons to focus on a few targeted landholders with large holdings and key

biodiversity assets, even to achieve landscape-scale collaboration. These are complex fit issues revealed through applying this framework that considers both ecological and institutional complexity.

The challenge of institutionalizing self-organizing efforts is a fourth fit issue identified. Specific initiatives such as the Tasmanian Rangelands Group, Midlandscapes and the MCF have provided a starting point for such efforts but are impeded by government reluctance to devolve authority and decision-making powers. While yielding to local demands may favor income-generating activities that compromise biodiversity benefits at larger scales (Perrings & Halkos, 2012), a principle of subsidiarity encourages devolution to the 'lowest' level with the capacity to act. Shifting some roles and responsibilities to bioregional entities can improve alignment between ecosystem and jurisdictional boundaries, and some local devolution can ensure conditions 'on the ground' are taken into account (Paavola et al., 2009). At the same time, central standard-setting and policy-making are necessary to harmonize approaches to conservation across landscapes and ensure provision of biodiversity as a public good (Ring, 2008). Striking this balance has been a long-standing challenge of environmental federalism in Australia (Crowley, 2001). A challenge for reforms able to build on 'bottom-up' self-organizing efforts is the tension between traditional notions of upward accountability and of local responsiveness downward and sideways (Moore & Rockloff, 2006). Although Australia's regionalized approach to NRM provides a governance level for resolving these tensions, there has been resistance to providing autonomy at this level, with control exercised through strong accountability mechanisms (Jennings & Moore, 2000). Even if authority is not devolved, reforms providing institutional support for self-organizing networks can help build adaptive capacity by providing spaces for testing new ideas and building social memory, ready for revitalization in times of system stress (Boyd and Folke, 2011). Looking at self-organizing activity and institutional support for such activity shows that both are critical for diagnosing fit, with such networks providing only limited value for progressing new solutions in a constrained institutional context.

**4.2 Diagnosing fit: diagnosing conflict**

The diagnosis of fit provided above sheds light on two areas of conflict with salience beyond this study region. One source of conflict arises from the presence of a public good on privately owned land. The other is adjudicating between land use objectives in these multi-functional landscapes, especially given that the future of biodiversity in such landscapes is increasingly being discussed in terms of 'novel' or 'hybrid' ecosystems (Hobbs et al., 2014).

The influence of property rights and associated lack of clarity around duty of care were evident in several issues of fit. While payment for provisions of public goods like biodiversity has become commonplace, determining which actions deserve payment is not straightforward. Such payments can 'crowd out' intrinsic motivations, and even restrict landholder conservation behaviors to those eligible for payment and only for the duration of those payments (Lockie, 2013; Vatn, 2010). In the case of the Midlands, landholders have come to expect financial assistance for conservation activities that they may have otherwise seen as their responsibility. Such issues are common for countries like Australia where the use of neo-liberal market-based approaches to solve conservation problems has become a default policy option, even when such instruments may not fit their intended purpose (Higgins et al., 2014; Lockie, 2013). In the Midlands, payment for conservation was frequently discussed as a panacea for resolving conflicts between private land and public good, yet there is no clear answer to which actions primarily benefit the public good and should be compensated, and which are better left to alternative options such as regulation (Lockie, 2013), or part of a basic albeit poorly defined duty of care (Earl, Curtis, & Allan, 2010). Deferring to compensation options can also undermine legitimacy, suggesting governments may be incapable of enforcing existing regulations (Lockie, 2013). Many interviewees did indeed think this was the case, expressing concerns about the relative weakness of governments compared with property rights, even if they did not think regulation should be the dominant solution.

The Midlands is a multi-functional landscape as it serves multiple purposes. Multifunctionality is the premise behind European agri-environmental initiatives that support landholder efforts to enhance

ecological values, while also fostering economic sustainability and local social capital (Lehmann, Schleyer, Wätzold, & Wüstemann, 2009; O'Farrell & Anderson, 2010). While Australia has failed to address multifunctionality in its formal institutions (Dibden, Potter, & Cocklin, 2009), respondents in this research embraced the concept, thus revealing a good cognitive fit between their framing and the problem of conserving biodiversity in this landscape. This finding also demonstrates the value of the conceptual framework, as this misfit was identified by drawing on the institutional literature, which emphasizes that the way ideas are framed determines the manner in which an issue is resolved, but that political and cognitive dimensions of institutions may be antithetical to solving the problem (Peters 2012).

Given the Midlands is highly modified, the classical approach of conserving intact ecosystems and restoring modified ecosystems may not be practical or even desirable (Hobbs et al., 2014). While codification of threatened species and vegetation types in legislation is an essential part of the conservation toolbox, allowing this listing to drive non-regulatory approaches is a risky strategy, particularly as climate envelopes shift and novel and hybrid ecosystems become a real prospect in the near future (Starzomski, 2013). The existence of important but unlisted lowland native grasslands suggests the Midlands is already an area where novel ecosystems bearing little resemblance to historical assemblages are highly possible and even desirable given the intensity of climate and land use as drivers of change (Hobbs et al., 2014). The focus on conserving species and communities as defined in regulation is therefore misplaced. Using the EPBC definition of lowland native grasslands is likely to result in an even greater institutional misfit as their component species shift geographically, in different directions, leading to very different vegetation communities (Harris et al., 2015). This exacerbates the already poor buffering ability of current institutions with conservation approaches constrained to protecting historical artifacts, rather than healthy, functioning ecosystems.

## 5.0 Conclusion

This paper has reported on the fitness of institutions in the Tasmanian Midlands of Australia for conserving critically endangered biodiversity values in a highly modified agricultural landscape. Using a novel diagnostic framework drawing on concepts from adaptive governance, institutional theory, and public administration, an expanded notion of fit helps demonstrate the amplifying effects of different institutional misfits. When biodiversity worth protecting is defined too narrowly, this constrains the problems that can be addressed, the solutions that are favored, and who can be involved in conservation. Many of the key drivers of biodiversity decline become neglected, competing demands are left to emerge rather than addressed proactively and coherently, and the flexibility to deal with emergence of novel ecosystems is undermined.

The diagnosis highlighted specific areas where institutional reform can address areas of poor institutional fit. Gaining a better understanding of the interactions between biodiversity and property rights and their expression in a multifunctional landscape can help drive reform (Berman, Quinn, & Paavola, 2012), and has already led to innovative collaborative institutions among landholders, scientists, and governments for deciding which landscape functions should be prioritized and protected and how (e.g. de Sainte Marie, 2014). Collaboration sits at the heart of overcoming the issues associated with property rights and the multiple objectives of a multi-functional landscape. This is especially the case when designing novel ecosystems given the value-laden questions involved, and the potential need to shift fundamental assumptions (Hobbs et al., 2014). The convergence of social and ecological challenges can lead to productive value conflicts, creating the right conditions for reform (Holland & Fleming, 2003). Explicit acknowledgement of the linkages between social and ecological dimensions suggests Midlands actors are better prepared to deal with the complexity of biodiversity governance than those that seek clear separations between these dimensions (Lockwood et al., 2012).

Conserving biodiversity remains an ongoing institutional challenge. The diagnosis of fit presented here provides insights into current performance and future needs, and has relevance beyond this study, especially for multifunctional landscapes. These include the importance of understanding the problems of narrow framing, the interplay between regimes, embedded power asymmetries, and the challenge of deliberately advancing self-organizing. The lens of multifunctionality and a focus on progressing towards novel and hybrid ecosystems provide a means of considering and resolving conflicts resulting from biodiversity institutions that are not fit for purpose, and can provide guidance for reform.

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